Amendments to the Claims

1. (Currently amended) A method of interleaving the transmission of time-critical packets with the transmission of lower-priority packets across a common data link, the method comprising:

maintaining time-critical packet arrival statistics;

when a lower-priority packet becomes available for transmission across the data link, estimating the transmit time required for transmission of that packet; and

based on the time-critical packet arrival statistics and the estimated transmit time for the lower-priority packet, predicting whether the lower-priority packet can be selected for transmission across the data link without causing substantial delay to a time-critical packet that is not yet available for transmission across the data link.~~; and~~

~~when predicting whether the lower-priority packet can be selected for transmission without causing substantial delay indicates that transmission at the current time is acceptable, supplying the lower-priority packet to the data link, otherwise, parking the lower-priority packet and performing the predicting step again at a later time.~~

2. (Original) The method of claim 1, wherein maintaining time-critical-packet arrival statistics comprises measuring the time of arrival for previously-received time-critical packets, and using the measured time of arrival for those packets to update an estimate of the expected time of arrival for the next time-critical packet.

3. (Original) The method of claim 2, wherein updating an estimate comprises updating a filter state using the measured time of arrival.

4. (Original) The method of claim 1, wherein when the time-critical packets comprise voice packets, maintaining time-critical-packet arrival statistics comprises measuring the speech pause interval between adjacent voice talkspurts using packet measured time of arrival, and maintaining statistics on the duration of speech pause intervals.

5. (Original) The method of claim 1, wherein, during a bi-directional packet voice conference, maintaining time-critical-packet arrival statistics comprises measuring the turnaround interval between the beginning of a silence interval for incoming voice conference

packets and the beginning of a talkspurt for outgoing time-critical packets, and maintaining statistics on the duration of the turnaround interval.

6. (Original) The method of claim 1, wherein maintaining time-critical-packet arrival statistics further comprises measuring the time between a time-critical packet's time of arrival and that same packet's end-of-transmission time.

7. (Currently amended) The method of claim 1, further comprising placing lower-priority packets in a lower-priority queue in the order received, wherein a lower-priority packet becomes available for transmission when it reaches the head of the queue.~~, and wherein parking a lower-priority packet comprises leaving it at the head of the queue.~~

8. (Original) The method of claim 1, wherein estimating the transmit time for a lower-priority packet comprises determining the packet's length and scaling that length by an estimated data link rate expressed in units of data divided by units of time.

9. (Original) The method of claim 1, wherein predicting whether the lower-priority packet can be selected for transmission without causing substantial delay comprises computing the time remaining until the expected arrival of the next time-critical packet and comparing the time remaining with the estimated transmit time for the lower-priority packet.

10. (Original) The method of claim 9, wherein transmission does not cause substantial delay if the estimated transmit time for the lower-priority packet does not exceed the time remaining until the expected arrival of the next time-critical packet by more than an allowable jitter.

11. (Original) The method of claim 9, wherein computing the time remaining until the expected arrival of the next time-critical packet comprises computing a time estimate $t_R = t_{NP} + k_\sigma \sigma_{NP} + j_A - t_C$, where t_{NP} is an expected arrival time estimate for the next time-critical packet, σ_{NP} is an arrival time standard deviation for the next time-critical packet, k_σ is a standard deviation multiplier, j_A is an allowable jitter, and t_C is the current time.

12. (Original) The method of claim 9, wherein computing the time remaining until the expected arrival of the next time-critical packet comprises receiving a pre-notification from an encoder that a time-critical packet is being built.

13. (Original) The method of claim 9, wherein computing the time remaining until the expected arrival of the next time-critical packet comprises receiving a pre-notification from a voice activity detector when voice activity begins and ceases.

14. (Canceled)

15. (Original) The method of claim 1, further comprising, when a time-critical packet becomes available for transmission across the data link, transmitting that packet as soon as the data link is available.

16. – 19. (Canceled)

20. (Currently amended) An apparatus comprising a computer-readable medium containing computer instructions that, when executed, cause a processor or multiple communicating processors to perform a method for interleaving the transmission of time-critical packets with the transmission of lower-priority packets across a common data link, the method comprising:

maintaining time-critical packet arrival statistics;

when a lower-priority packet becomes available for transmission across the data link, estimating the transmit time required for transmission of that packet; and

based on the time-critical packet arrival statistics and the estimated transmit time for the lower-priority packet, predicting whether the lower-priority packet can be selected for transmission across the data link without causing substantial delay to a time-critical packet that is not yet available for transmission across the data link.; and

~~when predicting whether the lower-priority packet can be selected for transmission without causing substantial delay indicates that transmission at the current time is acceptable, supplying the lower-priority packet to the data link, otherwise, parking the lower-priority packet and performing the predicting step again at a later time.~~

21. (Original) The apparatus of claim 20, wherein maintaining time-critical-packet arrival statistics comprises measuring the time of arrival for previously-received time-critical packets, and using the measured time of arrival for those packets to update an estimate of the expected time of arrival for the next time-critical packet.

22. (Original) The apparatus of claim 21, wherein updating an estimate comprises updating a filter state using the measured time of arrival.

23. (Original) The apparatus of claim 20, wherein when the time-critical packets comprise voice packets, maintaining time-critical-packet arrival statistics comprises measuring the speech pause interval between adjacent voice talkspurts using packet measured time of arrival, and maintaining statistics on the duration of speech pause intervals.

24. (Original) The apparatus of claim 20, wherein, during a bi-directional packet voice conference, maintaining time-critical-packet arrival statistics comprises measuring the turnaround interval between the beginning of a silence interval for incoming voice conference packets and the beginning of a talkspurt for outgoing time-critical packets, and maintaining statistics on the duration of the turnaround interval.

25. (Currently amended) The apparatus of claim 20, further comprising placing lower-priority packets in a lower-priority queue in the order received, wherein a lower-priority packet becomes available for transmission when it reaches the head of the queue~~, and wherein parking a lower-priority packet comprises leaving it at the head of the queue.~~

26. (Original) The apparatus of claim 20, wherein predicting whether the lower-priority packet can be selected for transmission without causing substantial delay comprises computing the time remaining until the expected arrival of the next time-critical packet and comparing the time remaining with the estimated transmit time for the lower-priority packet.

27. (Original) The apparatus of claim 26, wherein transmission does not cause substantial delay if the estimated transmit time for the lower-priority packet does not exceed the time remaining until the expected arrival of the next time-critical packet by more than an allowable jitter.

28. (Original) The apparatus of claim 26, wherein computing the time remaining until the expected arrival of the next time-critical packet comprises computing a time estimate $t_R = t_{NP} + k_\sigma \sigma_{NP} + j_A - t_C$, where t_{NP} is an expected arrival time estimate for the next time-critical packet, σ_{NP} is an arrival time standard deviation for the next time-critical packet, k_σ is a standard deviation multiplier, j_A is an allowable jitter, and t_C is the current time.

29. (Original) The apparatus of claim 26, wherein computing the time remaining until the expected arrival of the next time-critical packet comprises receiving a pre-notification from an encoder that a time-critical packet is being built.

30. (Original) The apparatus of claim 26, wherein computing the time remaining until the expected arrival of the next time-critical packet comprises receiving a pre-notification from a voice activity detector when voice activity begins and ceases.

31. (Original) The apparatus of claim 20, the method further comprising, when a time-critical packet becomes available for transmission across the data link, transmitting that packet as soon as the data link is available.

32. – 51. (Canceled)